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web and servers with quer\$ near caches	31

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L12: Entry 5 of 7

File: USPT

Nov 26, 2002

US-PAT-NO: 6487641

DOCUMENT-IDENTIFIER: US 6487641 B1

TITLE: Dynamic caches with miss tables

DATE-ISSUED: November 26, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cusson; Michael J.	Chelmsford	MA		
Almeida; Marcos G.	Nashua	NH		
Sunkara; Ramu V.	Los Altos	CA		
D'Silva; Anil J.	Nashua	NH		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Oracle Corporation	Parkwood Shores	CA			02

APPL-NO: 09/ 654653 [PALM]

DATE FILED: September 5, 2000

PARENT-CASE:

CROSS-REFERENCES TO RELATED APPLICATIONS The present patent application is a continuation-in-part of U.S. Ser. No. 09/294,656, Cusson, et al., Web servers with queryable dynamic caches, filed Apr. 19, 1999, and. claims priority from U.S. Provisional Application No. 60/168,589, Cusson et al., Improving the performance of dynamic data caches by collecting multi-user query miss statistics, filed Dec. 2, 1999. The patent application contains the entire Detailed Description and drawing of U.S. Ser. No. 09/294,656. The new material begins with FIG.7 and the section of the Detailed Description entitled Making cache misses faster.

INT-CL: [07] G06 F 12/00

US-CL-ISSUED: 711/144; 711/141, 711/118, 709/220

US-CL-CURRENT: 711/144; 709/220, 711/118, 711/141

FIELD-OF-SEARCH: 711/141-144, 711/118, 707/2, 707/10, 707/202, 709/202-203, 709/220, 712/218

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>5924096</u>	July 1999	Draper et al.	707/10
<input type="checkbox"/>	<u>5940594</u>	August 1999	Ali et al.	709/203
<input type="checkbox"/>	<u>6098064</u>	August 2000	Pirolli et al.	707/2
<input type="checkbox"/>	<u>6128627</u>	October 2000	Mattis et al.	707/202
<input type="checkbox"/>	<u>6148394</u>	November 2000	Tung et al.	712/218
<input type="checkbox"/>	<u>6173311</u>	January 2001	Hassett et al.	709/202

ART-UNIT: 2187

PRIMARY-EXAMINER: Yoo; Do Hyun

ASSISTANT-EXAMINER: Moazzami; Nasser

ABSTRACT:

A middle-tier Web server with a queryable cache that contains items from one or more data sources. Items are included in the cache on the basis of the probability of future hits on the items. When the data source determines that an item that has been included in the cache has changed, it sends an update message to the server, which updates the item if it is still included in the cache. In a preferred embodiment, the data source is a database system and triggers in the database system are used to generate update messages. In a preferred embodiment, the data access layer determines whether a data item required by an application program is in the cache. If it is, the data access layer obtains the item from the cache; otherwise, it obtains the item from the data source. The queryable cache includes a miss table that accelerates the determination of whether a data item is in the cache. The miss table is made up of miss table entries that relate the status of a data item to the query used to access the data item. There are three statuses: miss, indicating that the item is not in the cache, hit, indicating that it is, and unknown, indicating that it is not known whether the item is in the cache. When an item is referenced, the query used to access it is presented to the table. If the entry for the query has the status miss, the data access layer obtains the item from the data source instead of attempting to obtain it from the cache. If the entry has the status unknown, the data access layer attempts to obtain it from the cache and the miss table entry for the item is updated in accordance with the result. When a copy of an item is added to the cache, miss table entries with the status miss are set to indicate unknown.

16 Claims, 8 Drawing figures

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L19: Entry 27 of 31

File: USPT

Aug 31, 1999

US-PAT-NO: 5944780

DOCUMENT-IDENTIFIER: US 5944780 A

TITLE: Network with shared caching

DATE-ISSUED: August 31, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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Gadde; Syam	Durham	NC		
Rabinovich; Michael	Gillette	NJ		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
AT&T Corp	New York	NY			02

APPL-NO: 08/ 850411 [PALM]

DATE FILED: May 5, 1997

INT-CL: [06] G06 F 15/16

US-CL-ISSUED: 709/201; 709/212, 709/213

US-CL-CURRENT: 709/201; 709/212, 709/213

FIELD-OF-SEARCH: 395/200.43, 395/200.46, 395/200.47, 395/200.56, 395/200.57, 395/200.31, 395/200.33, 395/200.42, 711/147, 711/148, 707/10

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected**Search ALL**

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>5222242</u>	June 1993	Choi et al.	395/200.57
<input type="checkbox"/>	<u>5276848</u>	January 1994	Gallagher et al.	711/121
<input type="checkbox"/>	<u>5511208</u>	April 1996	Boyles et al.	395/800
<input type="checkbox"/>	<u>5715395</u>	February 1998	Brabson et al.	395/200.56

OTHER PUBLICATIONS

Radhika Malpani et al, "Making World Wide Web Caching Servers Cooperate,"
<http://www.w3.org/Conferences/WWW4/Papers/59/> Fourth International WWW Conference
held in Boston, Mass., Dec. 1995.
"Reduce, Reuse, Recycle: An Approach to Building large Internet Caches" by Syam
Gadde, Michael Rabinovich and Jeff Chase, Jan. 15, 1997. The Sixth Workshop on Hot
Toics In Operating Systems, IEEE Conference Proceedings, Cape Cod, MA, USA, 1997,
970505-970506.

"GeoPlex Convergence Software for Integrated Global and Enterprise Networks",
Geosphere Communications, Inc., Technology Backgrounder, Sep., 1996.

ART-UNIT: 276

PRIMARY-EXAMINER: Geckil; Mehmet B.

ABSTRACT:

In a computer network system, the caches at individual stations are available to other stations. A central cache directory is maintained at a network server. Each time a station caches a data object received from a remote network, it informs the central cache directory. When a station comes online, it is asked to send a list of the contents of its cache. Whenever a station seeks an object from the remote network, the local network server first checks the central directory cache to see if the request can be satisfied at one of the local stations. Only if it cannot is the requested object retrieved from the remote network.

15 Claims, 4 Drawing figures